

WHAT IS CLAIMED IS:

1. A digital modulation type signal transmission apparatus for digitally modulating a plurality of signals for transmission including a transmission side and a reception side, said reception side comprising:

an input terminal to which information codes are applied;

a first modulation circuit coupled with said input terminal for assigning each of said information codes to any one of a plurality of signal points arranged on an I-Q complex plane and converting said information codes to first signals corresponding to coordinates of the assigned signal points;

a second modulation circuit for assigning a pilot signal used for demodulating said information codes, and an auxiliary signal including TMCC information to be arranged on different signals points on the I-Q complex plane and converting said pilot signal and said auxiliary signal to respective second signals corresponding to coordinates of the assigned signal points; and

a transmission unit coupled with said first and second modulation circuit for transmitting said first and second signals.

2. An apparatus according to claim 1, wherein said transmission unit includes a distributing circuit for distributing said first and second signals from said first and second modulation circuit to a plurality

of different carriers, respectively.

3. An apparatus according to claim 1, wherein said transmission unit includes a distributing circuit for distributing said first and second signals from said first and second modulation circuit to a single carrier in a time-divisional manner.

4. An apparatus according to claim 1, wherein said auxiliary signal and said pilot signal are positioned such that the position of the signal point for said auxiliary signal is different from the position of the signal point for said pilot signal in the direction from the origin of said I-Q complex plane.

5. An apparatus according to claim 2, wherein a direction of the position of the signal point for said auxiliary signal from the origin of said I-Q complex plane is oriented at a right angle to a direction of the position of the signal point for said pilot signal from the origin of said I-Q complex plane.

6. An apparatus according to claim 1, wherein said second modulation circuit assigns said pilot signal and said auxiliary signal in accordance with one of a BPSK scheme and a DBPSK scheme.

7. An apparatus according to claim 6, wherein said pilot signal is positioned on the I-axis on said I-Q complex plane, and said auxiliary signal is positioned on the Q-axis.

8. An apparatus according to claim 6, wherein

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said apparatus uses an orthogonal frequency division multiplexing modulation (OFDM) scheme for transmitting said information code with a plurality of orthogonal function based carriers, said carriers being modulated with said information code by a modulation method to which synchronous detection can be applied.

9. An apparatus according to claim 1, further comprising:

a display device on a reception side, said display device displaying said I-Q complex plane on a display screen thereof, and displaying a signal point for said information code, a signal point for said pilot signal, and a signal point for said auxiliary signal on said I-Q complex plane on said display screen, wherein the signal point for said auxiliary signal is displayed at a position different from a position at which the signal point for said pilot signal is displayed.

10. In a digital modulation signal transmission apparatus for digitally modulating a plurality of signals for transmission, including a transmission side and a reception side, a method of displaying a received signal in said reception side comprising the steps of:

receiving a transmission signal from said transmission side in which each of information codes are assigned to any one of a plurality of signal points arranged on an I-Q complex plane, a pilot signal used for demodulating said information codes and an

auxiliary signal including TMCC information are assigned to be arranged on different signal points on the I-Q complex plane, said transmission signal being a signal modulated based on coordinates corresponding to the assigned signal points,

displaying said I-Q complex plane on a screen of a display device provided at said reception side;

displaying said signal point of said information code demodulated from said received transmission signal on said I-Q complex plane;

displaying a signal point of said pilot signal demodulated from said received signal on a predetermined first position on said I-Q complex plane; and

displaying a signal point of said auxiliary signal demodulated from said received transmission signal on a predetermined second position different from said first position on said I-Q complex plane.

11. A signal display method according to claim 10, wherein said auxiliary signal and said pilot signal are positioned such that the displayed position of the signal point for said auxiliary signal is different from the displayed position of the signal point for said pilot signal in the direction from the origin of said I-Q complex plane.

12. A signal display method according to claim 11, wherein a direction of the position of the signal point for said auxiliary signal from the origin of said

I-Q complex plane is oriented at a right angle to a direction of the position of the signal point for said pilot signal from the origin of said I-Q complex plane.

13. A signal display method according to claim 12, wherein said pilot signal is positioned on the I-axis on said I-Q complex plane, and said auxiliary signal is positioned on the Q-axis.

14. A signal transmission/reception system for digital modulating, wherein each of information codes is assigned to any one of a plurality of signal points arranged on an I-Q complex plane, a pilot signal used for demodulating said information codes and an auxiliary signal are assigned to be arranged on signals points on the I-Q complex plane, a signal modulated based on coordinates corresponding to the assigned signal points is transmitted, the transmitted signal is received, and the received signal is demodulated to reproduce the information codes, and wherein the signal points of said auxiliary signal and said pilot signal are arranged on different positions on said I-Q complex plane.